

SYSTEM AND METHOD FOR PROVIDING AN AUTOMATIC TELEPHONE
CALL BACK FROM INFORMATION PROVIDED AT A DATA TERMINAL

FIELD OF THE INVENTION

The present invention relates to telephony systems and more particularly, to a system and method for providing an automatic telephone call back in response to a request provided from a data terminal.

BACKGROUND OF THE INVENTION

Telephony call centers, which place outbound calls and receive inbound calls (often called call campaigns), typically utilize a telephone call center management system to help automate much of the process. The telephone call center management system controls, among other functions, the dialing of outbound telephone numbers from a predefined, sorted call list having a number of customer call records. These customer call lists may be downloaded from a call record source, such as a host computer, to the telephone call center management system once during a 24 hour period, often during the non-busy early hours of the morning, or may be continuously and dynamically downloaded for dynamic updating of call records within a call list. The telephone call center management system automatically connects outbound calls and

1 inbound calls to available operators or agents for handling.

2 In the past, the overwhelming majority of customers or
3 potential customers (collectively "inquiring parties") contacted
4 the call center by telephone to obtain information. These
5 inquiring parties may be calling for many different reasons. For
6 example, the inquiring parties may want information on the
7 company's products or services, or may want information on their
8 existing account with the company. Often there are no agents
9 available at the company to provide the requested information, and
10 the inquiring party must wait on hold for an available agent,
11 receive the information by way of recorded messages, or call back
12 at another time.

13 With the advent of global or large scale computer networks
14 such as the Internet (also known as the World Wide Web), it is now
15 possible for companies to provide information "on-line" that is
16 accessible by its customers or potential customers via a data
17 terminal (e.g. a PC) connected to the network. A company may
18 provide "on-line" information about products and/or services that
19 might be of interest to an inquiring party, as well as information
20 on the status of a party's account. One way of providing on-line
21 information is with hypertext documents on the World Wide Web
22 created using Hypertext Markup Language (HTML). By browsing
23 through these "web pages" using the data terminal, the inquiring
24 party can obtain information in the form of text, graphics and/or

1 sound.

2 Although the Internet or other such computer network provides
3 an additional medium for communicating information to inquiring
4 parties, a party may still want assistance from a "live" agent.
5 Some "web pages" allow inquiring parties to request a call back by
6 including a field for the inquiring party to provide a telephone
7 number or other such information related to contacting the party
8 with a "live" agent. These requests are typically transmitted to
9 the company, for example, in the form of electronic mail and
10 stored in a file. The telephone numbers and other relevant
11 information are then manually entered into an existing telephone
12 call center management system. The call back is then made at a
13 later, less convenient time using the existing telephony system,
14 e.g., by having an agent manually call back or by calling back and
15 placing the party on hold. If the inquiring party needs
16 assistance, e.g., with an account, a product/service, or the like,
17 the existing systems are unable to provide that assistance at the
18 time requested by the inquiring party.

19 An immediate call back is often the ideal time for responding
20 to a request by the inquiring party. The inquiring party is
21 interested in this particular product, service, or information at
22 the moment the request is made and is likely to be proximate to a
23 telephone. Providing an immediate connection to an agent,
24 however, presents an additional problem. One common way to

1 connect to the Internet / World Wide Web is by using a PC with a
2 modem that dials in to an Internet Service Provider (ISP) over the
3 Public Switched Telephone Network (PSTN). If the only available
4 telephone line is being used for connecting to the network, an
5 immediate call back may not be possible since the inquiring party
6 is likely to still be connected to the network (i.e., "on-line")
7 when the attempted call back is made. When dialing outbound
8 calls, existing telephony systems will typically treat a busy
9 signal as a failed attempt and will schedule a recall at a later
10 point in time. Thus, the inquiring party will not receive the
11 assistance as soon as possible after the request has been made.

12 As the usage of the Internet and other global computer
13 networks increases, an increasing number of individuals will want
14 to use this medium of communication to contact companies for
15 requesting information. Existing telephone call center management
16 systems are not integrated with global computer networks in a
17 manner that allows a company to automatically and efficiently
18 respond to requests made over the global computer network by
19 inquiring parties with call backs at the most convenient time.

20 Accordingly, what is needed is a system and method for
21 providing an automatic telephone call back to an inquiring party
22 who has provided a request to a company from a remote data
23 terminal. What is also needed is an automatic call back system
24 and method that employs call scheduling and predictive dialing to

1 ensure that a call back is made at a time convenient to the
2 inquiring party, e.g. immediately or at another time specified by
3 the inquiring party.

4 SUMMARY OF THE INVENTION

5 The present invention features a system and method for
6 providing a telephone call back from call back data transmitted
7 over a data path, such as a global computer network, using a data
8 terminal at a remote location. The system includes a data path
9 interface coupled to the data path, for receiving the request, for
10 identifying the call back data, and for placing the call back data
11 into at least one call record store. The system further includes
12 an automatic dialing system responsive to the call record store,
13 for retrieving the telephone numbers in the call record store,
14 automatically calling the numbers, and connecting to an available
15 agent if a call is answered.

16 The automatic dialing system preferably includes a call scheduler,
17 for ordering and scheduling the telephone numbers to be called,
18 and a predictive dialer, responsive to the ordered telephone
19 numbers, for initiating dialing of each of the numbers. The
20 predictive dialer preferably includes a call pacer that paces
21 dialing of the telephone numbers using a pacing algorithm.

22 The present invention also features a method for providing a
23 telephone call back from a request made by an inquiring party at

1 remote location. The request includes call back data transmitted
2 over a data path, such as the global computer network, from a
3 terminal at the remote location. The method comprising the steps
4 of: receiving the request transmitted from the terminal at the
5 remote location; identifying the call back data including at least
6 one telephone number to be dialed; placing the call back data into
7 a call record store; retrieving telephone numbers to be dialed
8 from the call record store; scheduling the telephone numbers to be
9 dialed; automatically dialing each of the telephone numbers as
10 scheduled over a telephone line; and connecting the telephone
11 line to a telephone of an available agent, if an answer is
12 detected.

13 In one embodiment, the method includes the step of attempting to
14 immediately connect the inquiring party to an available agent, for
15 example, using the global computer network. The method also
16 includes scheduling at least one of the numbers for an immediate
17 call back and scheduling at least one of the numbers for a call
18 back at a time to call provided by the inquiring party in the call
19 back data. If no connection is made, the method includes the step
20 of adding the telephone number to a future call campaign.

21 22 BRIEF DESCRIPTION OF THE DRAWINGS

23 These and other features and advantages of the present
24 invention will be better understood by reading the following

1 detailed description, taken together with the drawings wherein:

2 FIG. 1 is a schematic block diagram of an automated telephone
3 call back system, according to the present invention, that
4 receives requests from remote locations over a data path;

5 FIG. 2 is a schematic block diagram of the automated
6 telephone call back system, according the preferred embodiment of
7 the present invention;

8 FIG. 3 is a schematic block diagram of the automated
9 telephone call back system used with various types of data paths,
10 according to the present invention; and

11 FIG. 4 is a flow chart illustrating the method of providing
12 an automatic call back, according to the present invention.

13 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

14 The automated telephone call back system 10, FIG. 1,
15 according to the present invention, provides an automatic
16 telephone call back to an inquiring party (e.g., a customer or
17 potential customer) who has requested assistance from a "live"
18 agent 12a-12c at a call center in a company or other organization.
19 The request is made from a remote location 14a-14d that includes a
20 data entry device, such as a PC, connected to the automated
21 telephone call back system 10 by way of a data path 16. The data
22 path 16 can be established through the Public Switched Telephone
23 Network (PSTN), the Internet / World Wide Web, an intranet, any

1 type of Wide Area Network (WAN), any type of Local Area Network
2 (LAN), and/or any other type of communication medium, as will be
3 described in greater detail below.

4 The inquiring party typically makes the request after making
5 an initial inquiry for information, such as product/service or
6 customer account information. This information is typically
7 provided by an information server 18 that is accessed by the
8 inquiring party at the remote location 14a-14d by way of the data
9 path 16. In one example, the information server 18 is a web
10 server that presents the information in the form of "web pages"
11 including on-line forms for entry of call back data used to make a
12 call back (e.g., telephone number, call back time) as well as
13 other inquiring party data (e.g., name, account number,
14 products/services of interest), as will be described in greater
15 detail below.

16 When a call back request is made, call back data and other
17 data is transmitted over the data path 16 to the automated
18 telephone call back system 10 either directly or by way of the
19 information server 18. The automated telephone call back system
20 10 processes the request and schedules a call back at a time when
21 the inquiring party is likely to be available, e.g. immediately
22 following the request or at a desired time specified by the
23 inquiring party.

24 According to the preferred embodiment, the automated

1 telephone call back system 10, Fig. 2, includes an automated
2 dialer system 20, for processing outbound call campaigns, and a
3 data path interface 22, for providing an interface or gateway
4 between the automated dialer system 20 and the data path 16 over
5 which the call back request is made. According to one example,
6 the automated dialer system 20 is implemented as part of a
7 telephony system, such as the type sold under the name UNISON® by
8 Davox Corporation, Westford, Mass. This type of telephony system
9 is disclosed in greater detail in U.S. Patent No. 5,592,543 issued
10 January 7, 1997, assigned to the assignee of the present
11 application and incorporated herein by reference. In the
12 telephony system, the agents 12a-12c each have a headset 24a-24c
13 or other voice processing device and a computer terminal 26a-26c
14 or other type of data input/output device connected to the
15 automated dialer system 10. The data path interface 22, the
16 automated dialer system 20, the agent terminals 26a-26c, and other
17 components of the system 10 are connected with a data path 34,
18 such as an ethernet network.

19 The data path interface 22 receives the call back data and
20 other inquiring party data transmitted over the data path 16 and
21 routes the call back data (e.g., telephone number, and time to
22 call) to a call record store 28 storing the call back data as a
23 list of call records. The call record store 28 can be a database
24 record, computer memory array, disk file, or any other storage

1 medium. The call record store 28 can be dynamically updated with
2 new call records as call back requests are received by the data
3 path interface 22. Other data pertaining to the inquiring party
4 (e.g., name, address, account number, products/services of
5 interest), may also be stored in a host account database 29. If
6 the inquiring party has been previously contacted (e.g., an
7 existing customer), additional data may be merged with the host
8 account database 29. The host account database 29 can be updated
9 by an upload of new data for each account at the end of a call
10 campaign or at the end of a predetermined time interval (e.g., the
11 end of the day). The host account database 29 can also be updated
12 online by way of a link 31 to the agent terminals 26a-26c.
13 Further, the host account database 29 can be updated by the user,
14 e.g., by way of a link 33 from the information server 18.

15 The automated dialer system 20 then processes the call
16 records in the call record store 28 as an outgoing telephone call
17 campaign. The automated dialer system 20 retrieves the call
18 records from the call record store 28 and processes the call
19 records, for example, according to preselected system scripts.
20 The automated dialer 20 automatically dials the telephone numbers
21 within the call records over one of the telephone (trunk) lines
22 32. The automated dialer system 20 monitors the status of the
23 call progress signals on the telephone lines 32, and when an
24 answer is detected, connects the call to a headset 24a-24c of the

1 available agent. Other information pertaining to the called party
2 can be linked by the automated dialer system 20 from the host
3 account database 29 to the terminal 26a-26c of the available
4 agent. The linked host data is preferably displayed
5 simultaneously at the terminal 26a-26c of the agent connected to
6 the call, for example, using software available from Davox Corp.
7 such as Smart Buttons, Sixth Sense, or the host Java applets in
8 LYRICall.

9 The automated dialer system 20 preferably includes a call
10 scheduler 36 for determining the optimum time to call each of the
11 numbers and for arranging the list call records accordingly. The
12 call scheduler 36 is typically implemented as a software program
13 and is described in U.S. Patent Application No. 08/699,292
14 entitled "Call Record Scheduling System And Method" assigned to
15 the assignee of the present invention and incorporated herein by
16 reference. The call scheduler 36 will prioritize the call records
17 based upon call back data specified by the inquiring party. If no
18 call back time is specified, the call records are given an
19 immediate call back priority since the inquiring party is likely
20 to be proximate to the telephone. Immediate call backs can be
21 repeated until a non-busy signal is detected since the inquiring
22 party may be using the telephone line to access the data path 16
23 (e.g., using a modem to connect to the Internet through an
24 Internet Service Provider). One example of this type of system is

disclosed in greater detail in co-pending, commonly-owned application Serial No. 09/057,749 filed April 9, 1998, entitled SYSTEM AND METHOD FOR PROVIDING AN AUTOMATIC TELEPHONE CALL BACK TO A TELEPHONE LINE BEING USED TO ACCESS A COMPUTER NETWORK, and incorporated herein by reference.

The automated dialer system 20 preferably includes a predictive dialer 30 that utilizes a call pacing algorithm which is designed to optimize the time utilization by the telephone call agents. A description of one type of predictive dialer and call pacing algorithm is disclosed in U.S. Patent No. 5,295,184 assigned to the assignee of the present application and incorporated herein by reference. The predictive dialer 30 controls the automatic dialing of the call back numbers as well as the dialing of numbers in other active outbound campaigns to minimize the amount of time a called party will have to spend on hold.

The data path interface 22 can include a number of different types of interfaces depending upon the type of data path 16 being used to transmit the call back data. According to the exemplary applications of the present invention, the data path 16, Fig. 3, between the remote location 14a-14d and the automated telephone call back system 10 is established using one or more of the following: a direct data path 60, (e.g., a direct telephone line with a modem or an ethernet / token ring line); a global computer

1 network 62 (e.g., the Internet / World Wide Web); and a telephone
2 network 64 (e.g., the PSTN). The present invention contemplates
3 using other types of data paths or communications media including
4 other types of local area networks, wide area networks, or global
5 information networks.

6 Where the direct data path 60 is used, a data terminal 70 at
7 the remote location 14a, such as a mall or other public location,
8 is directly connected to the information server 18, for example,
9 using a direct telephone line with a modem or a Local Area Network
10 (LAN) line to a LAN, such as an Ethernet or Token Ring network.
11 In this example, the data path interface 22 provides an interface
12 to that particular type of LAN, for communicating with the data
13 terminal 70. The data terminal 70 can include a telephone with a
14 direct telephone line to the automated dialer system 20 to allow
15 telephonic communication with the inquiring party at the terminal
16 70. If a telephone is provided with the data terminal 70, an
17 immediate call back can be made to the predetermined telephone
18 number while the inquiring party is at the terminal 70. If no
19 telephone is provided with the data terminal 70, the inquiring
20 party can specify a telephone number and time for the return call.

21 Where the global computer network 62 is used to establish the
22 data path 16, the remote location 14b, 14c includes a computer
23 terminal 72, 74 connected to the global computer network 62,
24 either directly or through the telephone network 64. In this

1 example, the information server 18 includes a computer that
2 generates hypertext documents using Hypertext Markup Language
3 (HTML) containing the information to be accessed by the inquiring
4 party. The computer terminal 72, 74 is used by the inquiring
5 party to access the information and includes a user interface to
6 display the hypertext documents provided by the information server
7 18 in the form of text, graphics, pictures, audio, and data (text)
8 entry fields (commonly known as "web pages").

9 If assistance is needed from a live agent, a document is
10 provided by the information server 18 that includes a data entry
11 form requesting the data necessary to make a call back as well as
12 other data pertinent to the request for assistance. The creation
13 of data entry fields and the transmission of the entered data to
14 the automated telephone call back system can be performed by a
15 Common Gateway Interface (CGI) script that runs on the server 18
16 or a JAVA language program that runs on the computer terminal 72,
17 74.

18 The data is then transmitted from the computer terminal 72,
19 74 to the automated telephone call back system 10 over the global
20 computer network 62. In this example, the data path interface 22
21 provides an interface to the global computer network 62, e.g., a
22 direct connection to the Internet or a connection through the
23 server 18, allowing the automated call back system 10 to receive
24 the call back data and store the call back data as a call record

1 in the call record store 28. In one example, the data path
2 interface 22 includes a TCP/IP port on a computer that will accept
3 call back data in fixed fields. The call back data can be
4 formatted using techniques (e.g., encryption, authentication,
5 etc.) that are well known in the art for network protocols.

6 Once received by the data path interface 22, the data can be
7 posted to call record store 28. If the call record store 28 is
8 server maintained, a socket connection similar to the data path
9 interface can be used to post the data to the call record store
10 28. If the call record store 28 is a database, the data path
11 interface 22 inserts or updates the appropriate table. If the
12 call record store 28 is a file, the data path interface 22 appends
13 to the end of the file. The automated dialer system 20 processes
14 the call records in a call campaign, as described above, and based
15 upon the request data, the call back can be made to a telephone
16 76, 78 at the location 14b, 14c or any other telephone number
17 specified by the inquiring party. In addition to computer
18 terminals 72, 74, the present invention contemplates other devices
19 capable of receiving and transmitting information over the
20 Internet / World Wide Web.

21 The data path interface 22 can also interface the agent
22 terminals 26a-26c to the global computer network 62, allowing the
23 inquiring party to exchange data and/or audio messages with the
24 agent over the global computer network 62. According to this

embodiment, the data path interface 22 includes well known firewall or proxy software to enable the agents 12a-12c to access the internet. To use the global computer network 62 as an audio data path to transmit audio in addition to data, the computer terminal 72, 74 and the agent terminal 26a-26c include voice over the internet packages, such as Webcall, Netmeeting, CU-See Me (Cornell University), and Cooltalk. Using voice over the internet or internet chat, an inquiring party at the computer terminal 72, 74 can be immediately connected to an agent at the terminal 26a-26c for assistance.

A direct connection to the global computer network 62 is established where computer terminal 72 at the remote location 14b, such as an office, is directly connected to the global computer network 62, for example, through a LAN having a direct internet connection by way of a leased line. This remote location 14b can also include a telephone 76 connected to the telephone network 64 on a telephone line 80 that is not used by the computer terminal 72 to access the global computer network 62. The telephone line 80 is thus available to receive a call back to telephone 76 while the computer terminal 72 is used to access the global computer network 62.

A connection to the global computer network 62 using the telephone network 64 is established where the computer terminal 74 at the remote location 14c, such as the inquiring party's

1 residence, uses a modem 82 connected to a telephone line 84 into
2 the telephone network 64. The modem 82 can be connected directly
3 to the telephone line 84 or can be connected through a telephone
4 78 at the location 14c. The computer terminal 74 accesses the
5 global computer network 62 by using the modem 82 to dial in to a
6 global computer network server 88, for example, maintained by an
7 Internet Service Provider (ISP), which provides an interface
8 between the telephone network 64 and the global computer network
9 62. The present invention contemplates other types of "dial-up"
10 connections to the internet using, for example, Integrated
11 Services Digital Network (ISDN), a cellular telephone network, or
12 other alternatives to conventional telephone connections.

13 For a "dial up" type connection, the same telephone line 84
14 is typically used by both the telephone 78 to receive calls and
15 the computer terminal 74 to access the global computer network 62.
16 Thus, the telephone line 84 may not be available for a call back
17 to the telephone 78 if the telephone line 84 is still in use to
18 access the global computer network 62. The present invention also
19 contemplates using a modem 82 having voice/data capabilities that
20 allows the computer terminal 74 to interrupt data transmission to
21 talk with an available agent and then resume data transmission.
22 The present invention also contemplates using call waiting in a
23 "friendly" way to disconnect the modem 82 when an immediate call
24 back is made.

1 Another type of data path 16 is an audio data path, for
2 example, provided through the telephone network 64, which is
3 accessed by a telephone 90 at the remote location 14d. In this
4 example, the telephone 90 is used by the inquiring party to access
5 recorded audio information at the information server 18 by way of
6 the telephone network, for example, by dialing an 800 number. If
7 assistance is needed from a "live" agent, the request data can be
8 entered by DTMF tones or audio (voice) input in response to
9 recorded audio prompts. In this example, the data path interface
10 22 includes an audio interface including, for example, a voice
11 recognition unit (VRU) designed to encode audio responses as data,
12 capable of being processed, stored, and retrieved digitally. One
13 example of a VRU is disclosed in U.S. Patent No. 5,164,981
14 assigned to the assignee of the present invention and incorporated
15 herein by reference. After digitally encoding the data, the data
16 path interface 22 stores the data as a call record in the call
17 record store 28 and automatically performs a call back, as
18 described above.

19 The automatic telephone call back method 300, Fig. 4,
20 according to the present invention, begins when the data path
21 interface 22 of the automated telephone call back system 20
22 receives a request for assistance from an agent, step 310. In one
23 embodiment, the automated telephone call back system 20 will
24 attempt to immediately connect or transfer the inquiring party to

1 an available agent, step 320. An immediate connection can be
2 made, for example, if the inquiring party is using a telephone to
3 request the information or if the inquiring party is using a
4 terminal that supports voice over the internet or internet chat.
5 In this example, the immediate connection of inquiring parties to
6 agents can be controlled using a web inbound electronic chat
7 distributor, as disclosed in co-pending, commonly owned
8 application Serial No. 09/052,514 filed March 31, 1998, entitled
9 WEB INBOUND CHAT DISTRIBUTOR, and incorporated herein by
10 reference. The web inbound electronic chat distributor will
11 determine if an agent is available, step 322, and will connect the
12 available agent to the inquiring party, step 324. If no agent is
13 available, and the inquiring party is willing to wait, step 326, a
14 hold message is played or displayed to the inquiring party until
15 an agent becomes available, step 328.

16 If the inquiring party is not willing to wait for an agent or
17 if immediate connection is not possible, the call back data (e.g.,
18 the telephone numbers to be dialed and call back time) is
19 identified by the data path interface 22, step 330, and relayed
20 into the call record store 28, step 332. The automated dialer
21 system 20 retrieves call records from the call record store, step
22 334, and, based upon other call back data transmitted by the
23 inquiring party, determines the most convenient time for a call
24 back and schedules the call backs accordingly, step 336. Unless

1 the inquiring party specifies a different time, an immediate call
2 back will be scheduled, since the inquiring party is likely to be
3 proximate the telephone.

4 The telephone numbers are then automatically dialed either
5 immediately or at the scheduled times, step 338, and the telephone
6 lines 32 over which the call is being made are monitored.
7 According to one example of the method where an immediate call
8 back is made, the telephone lines 32 are monitored to determine if
9 a busy signal is received, step 339, indicating that the telephone
10 line connected to the telephone of the inquiring party is probably
11 being used to connect to the global computer network 62. If a
12 busy signal is detected, the predictive dialer will immediately,
13 and in one embodiment continuously, redial the telephone number,
14 step 341, for example, as disclosed in co-pending application
15 Serial No. 09/057,749 referenced above. This will ensure the
16 connection of the telephone call as soon as the telephone line is
17 free.

18 If a connection is made, step 340, the inquiring party is
19 connected to an available agent, step 324, by transferring the
20 voice to the agent's telephone 24a-24c and by transferring any
21 other relevant data pertaining to the called party to the agent's
22 terminal 26a-26c. If no connection is made, step 340, the
23 telephone number is scheduled for a future call campaign to be
24 called at a later time, step 342.

1 Accordingly, the automated telephone call back system of the
2 present invention provides an automatic call back to an inquiring
3 party (e.g., customer or potential customer) in response to a
4 request made by the inquiring party while accessing information
5 over a data path. In addition, the automated dialer system has
6 the capacity to efficiently process the call backs by scheduling
7 the calls as the most convenient time (e.g. a time specified by
8 the inquiring party), by automatically dialing and pacing the
9 calls so that an agent capable of handling the call will be
10 immediately available when a connection is made. Moreover, if the
11 inquiring party makes the request while on the Internet, the
12 present invention is capable of contacting the inquiring party as
13 soon as possible after the inquiring party has stopped using their
14 computer modem.

15 Modifications and substitutions by one of ordinary skills in
16 the art are considered to be within the scope of the present
17 invention which is not to be limited except by the claims which
18 follow.

19 What is claimed is: